

# **AN EVALUATION OF A SOUTH AFRICAN THINKING SKILLS**

## **PROGRAMME FOR PRIMARY SCHOOL LEARNERS:**

### **A FOLLOW- UP STUDY**

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## **DECLARATION**

I, the undersigned, hereby declare that the work contained in this assignment is my own original work and that I have not previously in its entirety or in part submitted it at any university for a degree.

Signature:

Date:

## SUMMARY

There is a need for learners to be taught thinking skills in South Africa and any thinking skills programme which is implemented needs to have been formally and scientifically researched. Unfortunately, many of the available programmes have not been fully researched.

The **Keys to Thinking Programme** is a thinking skills programme, which has specifically been designed for South African learners. The programme was only partially evaluated (Hermanson, 1998) and there was therefore a need to complete the research. This study has set out to do this.

The research objective of this study is thus to complete the research started by Hermanson (1998) and to evaluate the **Keys to Thinking Programme** to determine its efficacy in enabling learners to become better thinkers. In order to determine this, the study focused on four main aspects to establish if learners were indeed better thinkers as a result of the implementation of the programme:

1. Enjoyment of the programme;
2. Transfer of the various skills and concepts taught in the programme;
3. Metacognition - the awareness of learners about their own thinking;
4. The ability of learners to be aware of and apply the four thinking dispositions.

The study was conducted within a qualitative framework and was descriptive in nature.

The study was conducted at a high school in the Western Cape with a group of Grade 8 learners. This was to ensure continuity, because Hermanson had conducted the study with the same group of learners who had then been in Grade 7. The study was conducted for eight months.

The following were the most important findings of the study:

- The learners enjoyed the programme.
- They were able to transfer skills and concepts which they had learnt in the programme to their school work and to other situations.
- Learners were more aware of their thinking.
- Learners were aware of and were able to apply the four thinking dispositions.

It was therefore possible to conclude that on the whole the **Keys to Thinking Programme** was effective in enabling learners to be better thinkers.



## SAMEVATTING

In Suid- Afrika bestaan daar 'n dringende behoefte om denkvaardighede aan leerders te onderrig. Dit is egter belangrik dat enige denkontwikkelingsprogram eers formeel en wetenskaplik geëvalueer word voordat dit geïmplementeer kan word. Ongelukkig is dit so dat baie van die beskikbare programme nie ten volle nagevors is nie.

Die **Keys to Thinking** program is 'n denkontwikkelingsprogram wat spesifiek vir Suid- Afrikaanse leerders ontwikkel is. Die program is slegs gedeeltelik geëvalueer (Hermanson, 1998) en daar was dus 'n behoefte om die navorsing van hierdie program te voltooi. Hierdie studie poog dus om dit te doen.

Die navorsingsdoelstelling van hierdie studie is dus om die navorsing te voltooi en om die effektiwiteit van die program om leerders in staat te stel om beter denkers te wees, te evalueer. Dit is gedoen deur op die volgende vier hoof aspekte te fokus:

1. Genot van die program.
2. Oordrag van verskeie vaardighede en konsepte, soos deur die program onderrig.
3. Metakognisie – die bewustheid van leerders oor hul eie denke.
4. Die vermoë van leerders om bewus te wees van en om die vier denkdissposisies toe te pas.

Die studie is binne 'n kwalitatiewe raamwerk voltooi en is beskrywend van aard.

Die studie is aan 'n hoërskool in die Wes Kaap voltooi, met 'n groep Graad 8 leerders. Die rede hiervoor was om kontinuïteit te verseker omdat die vorige studie met dieselfde leerders onderneem was toe hulle in Graad 7 was.

Die vernaamste bevindinge van die studie is soos volg:

- Die leerders het die program geniet.
- Daar is bewyse dat oordrag wel plaasgevind het – na hul skoolwerk en in die algemeen.
- Leerders was meer bewus van hul denke en om meer denkend te wees.
- Leerders was meer bewus van en in staat om die vier denkdisposisies toe te pas.

Die **Keys to Thinking** program was dus effektief om leerders in staat te stel om beter denkers te wees.

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**“I have found that, to make a contented slave, it is necessary to make a thoughtless one. It is necessary to darken his moral and mental vision ... he must be able to detect no inconsistencies in slavery; he must be made to feel that slavery is right.”**

**(Frederick Douglass, American fugitive slave, autobiographer , and abolitionist leader, 1845. (Jacobs, 1998: 13)**

**“ It is generally accepted that one of the most important tasks that formal education can hope to accomplish, is to produce individuals who can think for themselves and who**

- can become what they think they can become: People who can judge for themselves;**
- have developed a much greater understanding and appreciation of their own potential and that of their fellow human beings; can effectively participate in social, economical and political processes;**
- are proactive and constructive;**
- have become free in far more than the political sense of the word!”**

**(From the preface of the Keys to Thinking Pupil's Workbook, 1994)**

# CHAPTER 1: ORIENTATION AND STATEMENT OF THE PROBLEM

## 1. INTRODUCTION, MOTIVATION FOR AND RELEVANCE OF THE PROPOSED RESEARCH

### 1.1 Contextualisation

This study focuses on the **Keys to Thinking Programme**, an explicit thinking skills programme which was developed for South African primary school learners in the early 1990's by the UPTTRAIL Trust (an acronym for the Upgrading of Teaching, Training and Learning. (See pp. 11- 17 for a brief description.)

In 1997 the programme was evaluated and implemented in a school in Stellenbosch over a period of seven months, as part of the Masters' in Education (Educational Psychology and Specialised Education) research of Hermanson (1998). This study was, however, based on only a section of the programme.

The most important findings were that :

- The learners on the whole accepted the idea of being thoughtful (quantitatively there was a statistically significant improvement in the application of two of the four dispositions, namely, to think broadly and adventurously and to think clearly and precisely);

- The learners were able to transfer this concept to other subjects and to their personal lives;
- The learners, teachers and administrators of the particular school experienced the need to think more effectively and to continue with the implementation of the programme at the school (Hermanson, 1998: ii).

This follow-up study will build on Hermanson's previous research in order to obtain a broader perspective on the experiences and applications of the total programme with the same learners over a period of two years (1997 and 1998).

The researcher has been a teacher for eighteen years. She has taught formally in secondary schools, but also has a qualification in Remedial Education and has, therefore, also been involved with primary school learners. She has taught only in disadvantaged areas and has constantly been exploring ways and means of enabling learners to reach their full potential. She has therefore seen the need for a thinking skills programme for South African learners which would enable and facilitate learners to develop their potential.

This study is part of a Masters in Education (Specialised Education) programme at the University of Stellenbosch.



## **1.2 Motivation for and relevance of the proposed research**

Education in South Africa is faced by more challenges than ever before. In many instances the legacy of Apartheid education is still in place (Christie, 1998: 111) and this means large classes, lack of adequate facilities and under-qualified teachers (Hofmeyer, in Naudè and Van der Westhuizen, 1998:159). This is clearly illustrated by the following:

If one considers the effectiveness of education in South Africa over the past 30 to 40 years, it is clear that the education system needs to be dramatically transformed if it is to succeed in preparing the child not only for the world of work, but also for social, political and moral maturity.

(Naudè and Van der Westhuizen, 1996: 159)

There are also the demands and expectations of the majority of people in South Africa, post- 1994, for example, the demand for "Equal Education for All" (Chisholm, 1998: 50; Fataar; 1998: 68, Steyn; 1999: 66).

Education therefore, is in the process of transformation and in the process of implementing a new curriculum which could contribute towards improving the quality of education for all. South Africa now has the unique opportunity of setting things right in this regard.

South Africa is at the beginning of an exciting phase. The new phase brings with it new expectations and demands. Since 1994, South Africa has become part of the international community, economically and politically, and all of this means that now more than ever before our learners have to leave school ready to meet not just the demands of the South African economy, but also the global job market. Research has shown that most school leavers do not

have the necessary skills for the job market (Nickerson in Baron and Sternberg, 1987: 31; McTighe and Schollenberger in Costa:1991: 1; Fisher, 1995: vii):

Thus South African education leaves many of its products ill-prepared to face a world characterised by technological, social, political and economic change. Each year large numbers of pupils leave the school system, while lacking the cognitive skills necessary to function as critical citizens.

(Naudè and Van der Westhuizen, 1996: 160)

The researcher, as a teacher on the Cape Flats, Cape Town, South Africa, has experienced this first hand. Many learners leave school at the end of Grade 12 (Matric) and are not able to find jobs. This Matric qualification does not necessarily include adequate transferable skills, other than perhaps the ability to communicate in one or more of the official languages.

The new outcomes- based curriculum seeks to address this. Upon examination the revised 12 critical outcomes of Curriculum 2005 should enable learners to:

1. Identify and solve problems in which responses display that responsible decisions using critical and creative thinking have been made.
2. Work effectively with others as members of a team, group, organization, community.
3. Organise and manage oneself and one's activities responsibly and effectively.
4. Collect, analyse, organise and critically evaluate information.



5. Communicate effectively using visual, mathematical and/or language skills in the modes of oral and /or written presentation.
6. Use science and technology effectively and critically, showing responsibility towards the environment and the health of others.
7. Demonstrate an understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation.

In order to contribute to the full personal development of each learner, and social economic development at large, it must be the intention underlying any programme of learning to make an individual aware of the importance of:

1. Reflecting on and exploring a variety of strategies to learn more effectively.
2. Participating as a responsible citizen in the life of local, national and global communities.
3. Being culturally and aesthetically sensitive across a range of social contexts.
4. Exploring education and career opportunities.
5. Developing entrepreneurial opportunities.

(Western Cape Education Dept, 2000: 2)

The key words are clearly **critical** and **creative thinking**, **problem-solving**, **organise**, **communicate**, **reflecting**, **exploring** and **developing**. Therefore, it becomes quite clear that cognitive education is to be part of the outcomes-based curriculum, understood and defined as education which develops

independent, critical thinkers. There is therefore, the need for South African programmes to explicitly develop these thinking skills.

In the introduction, the need for thinking skills programmes in South Africa has been highlighted. The problem, however, is that not many programmes have been rigorously and formally researched (OECD, 1990: 215). The further problem is that there are not many South African thinking skills programmes available and whilst there are, however, numerous thinking skills programmes on the international market ( Sholseth and Watanabe, in Costa, 1991: 114), the challenge is to find a programme suited to our needs in South Africa and meeting our requirements (Hermanson, 1998: 2; Slamet, 1998: 3).

## **2. THE RESEARCH PROBLEM**

The research problem leads directly from the relevance of the study and can be summarised as follows:

Whilst there are a variety of thinking skills programmes available, relatively little formal scientific research on assessing the efficacy of these programmes has been done.

Each country has unique educational realities and needs and although an explicit thinking skills programme has been developed for the South African context, this programme (as stated earlier) has only been partially evaluated.



### 3. RESEARCH OBJECTIVE AND AIMS

The objective of this study is to evaluate the **Keys to Thinking Programme** as a follow-up study.

The aim is to determine the effectiveness of the programme in enabling the learners to become better thinkers and learners, by establishing if:

1. **They enjoyed the programme** (this is linked to the “joy principle” which suggests that if learners are relaxed and enjoyed the lessons, learning is more effective (Botha, 1990: 44; Du Preez and Naudè, 1985: 49- 59; Hand, 1986: 11; Wolfe and Brandt, 1998: 13). (See p. 16 for more detail.)
2. **Transfer took place** (this is based on the premise that learning and thinking is effective if learners are able to transfer what they have learnt in one situation to a different context (OECD, 1990: 215; Perkins and Swartz. 1992: 2). (See p. 13 for more detail.)
3. **Learners were more aware of their own thinking**, if they were able to think metacognitively (it is suggested that if learners become more aware of their thinking, it will be more effective (Beyer, 1988: 7; Costa, 1991: 102; Perkins and Swartz, 1992: 2; Slavin, 1994: 232). (See p. 13 for more detail.)
4. **Learners were able to apply the four thinking dispositions** (Give thinking time! Make thinking broad and adventurous! Make thinking clear

and careful! Make thinking organised!) and therefore becoming better thinkers (Cilliers, Botha, Capdevielle, Perkins and Van der Vyver, 1994: 261; Newman, 1992: 108; Perkins, Jay, Tishman, 1993: 6- 9) (See pp. 12- 13 for more detail.)

## 4. TERMINOLOGY

### 4.1 Evaluation

Literature (Bless and Higson- Smith, 1995: 48; Harland, 1996: 91; Hitchcock and Hughes, 1995: 31; Wolf, 1994: 4758), distinguishes between formative evaluation (designed to promote the effectiveness of a programme) and summative evaluation (to provide evidence about the usefulness of a programme). Because this is a follow- up study, it could be regarded as primarily summative in nature.

In the context of this study, evaluation refers to the summative evaluation of an educational programme for the explicit teaching of thinking skills.

### 4.2 Thinking skills programme

This refers to a programme explicitly designed to teach thinking and for the purpose of this study it refers to the **Keys to Thinking Programme**.

The aim of the **Keys to Thinking Programme** is: “ ... to teach pupils how to be effective thinkers and learners..... to reason well, to be reflective and to think independently ” (Perkins, Capdevielle, Chonco, Cilliers, Goodrich, ka Sibisi, Tishman, Van Heusden, Viljoen, 1992:1).

### **4.3 Primary school learners and follow- up study**

For the purpose of this study, primary school learners refer to a group of learners in a particular primary school in the Western Cape, who were taught the **Keys to Thinking Programme**. Grade eight learners refer to the same group of learners who continued with the programme the following year, and were part of the follow- up study.

## **5. RESEARCH DESIGN**

### **5.1 Nature of research**

The research is qualitative and descriptive in nature (See validation thereof in Chapter two, pp. 17- 18.)

### **5.2 Research method**

The following methods will be utilised (see Chapter two, pp. 17- 25 for detail):

#### **5.2.1 Questionnaire**

#### **5.2.2 Spontaneous sketch**

#### **5.2.3 Observational notes**

#### **5.2.4 Focus group interviews**

#### **5.2.5 Peer validation**

## **6. STRUCTURE OF PRESENTATION**

Chapter two: Research Design (pp. 11- 27).

Chapter three: Research Findings and Analyses (pp. 28- 54).



Chapter four: Conclusions, Limitations and Recommendations. (pp. 55- 59).

## 7. SUMMARY

In this chapter the study is contextualised and motivated. The need for thinking skills in the South African situation with regard to the inequalities which still exist as a result of Apartheid, transformation in education, the ill-preparedness of school leavers and the new outcomes-based curriculum was established.

With regard to the research problem, the fact that not enough research has been done on South African thinking skills programmes in particular and international thinking skills programmes in general were highlighted.

The objective and aims of this study, which are to evaluate the **Keys to Thinking Programme** as a follow- up study and to determine its effectiveness in enabling learners to think better, were presented.

Terminology relevant to this study was defined and the research method and data collection procedure were outlined and finally, the structure of this study was presented.

In the following chapter (Chapter two), the research design will be validated and discussed.

## CHAPTER TWO: RESEARCH DESIGN

### 1. INTRODUCTION

In the course of this chapter the way in which the research was approached and done will be discussed. This will include a brief description of the programme for further contextualisation and refinement of the research objective and method, with reference to the reliability and validity of the procedures used.

As stated earlier, this study is a follow up of a study conducted by Hermansen. The study was conducted with the same group of learners used in the earlier study (Hermanson, 1998) to ensure continuity.

#### 1.1 Brief description of the programme to be evaluated

A detailed description of the programme is not part of the objective of this study. The researcher, however, deems it necessary to briefly describe the programme in order to further contextualise the research design.

The **Keys to Thinking Programme** was as stated earlier, developed by the UPTTRAIL Trust in 1992. The programme is based on the belief that intelligence can be grown, learnt and developed:

Nobody is born intelligent; every normal human being is born with the potential to become so. Nobody knows how to speak at birth, but each one is born with the capacity to talk, but he/she has to learn. Likewise, a child is born with the capacity to think, but again this capacity has to be developed through learning.

(Cilliers, Botha, Capdevielle, Perkins and Van der Vyver, 1994: 259)



This clearly demonstrates the need to teach thinking and develop thinking skills. The developers of the programme have emphasised the importance of intellectual independence, and have therefore propounded the concept of democratisation of knowledge as being central to the achievement of a truly democratic society.

A focus on good thinking dispositions forms the basis of the programme and this will now be discussed, as well as other key concepts emphasised in the programme, namely, transfer, metacognition, understanding and creative problem solving. The teaching methodology that was utilised will also be explained and a brief description given of the lessons that were taught.

#### **1.1.1 The dispositional approach**

The literature cites numerous approaches to the teaching of thinking. Newman (1992: 108) refers to knowledge and skills approaches, as well as the dispositional approach. The dispositional approach emphasises that the teaching of thinking requires not only the skills and strategies of thinking, but better thinking dispositions: "Without dispositions of thoughtfulness, neither knowledge nor the tools for applying are likely to be used." (Newman, 1992: 108).

A disposition means the tendency to think in a certain way and the **Keys to Thinking Programme** therefore has the premise that dispositions are "powerful organizers and mobilizers of human cognition" (Cilliers et al., 1994: 261).

The programme highlights four good thinking dispositions (Cilliers et al., 1994: 261) and they are specifically chosen:

- To counter impulsiveness: **Give thinking time!** (Avoid hasty thinking.)
- To encourage creative thinking: **Make thinking broad and adventurous!** (Avoid narrow thinking.)
- To foster care, precision and critical analysis: **Make thinking clear and careful!** (Avoid fuzzy thinking.)
- To be more systematic in thinking: **Make thinking organized!** (Avoid sprawling thinking.)

#### 1.1.2 A deliberate focus on transfer of thinking skills

Transfer can be defined as the process whereby something which is taught in one context can be transferred to and applied in another context (Perkins and Swartz, 1992: 2). In the **Keys to Thinking Programme** this is taught explicitly, and learners are constantly encouraged to transfer what they have learnt to different contexts.

#### 1.1.3 A deliberate focus on metacognition

Metacognition can broadly be defined as thinking about your thinking. (Costa, 1991: 102, 211). By asking learners to reflect on what happens when they are thinking, we are asking them to be more aware of their thinking and therefore begin to be critical of and evaluate their thinking. In the **Keys to Thinking Programme**, specific attention is paid to enabling learners to do that.



#### **1.1.4 A deliberate focus on understanding**

Understanding is also one of the key concepts selected for this programme. Understanding is of particular importance in educational settings and in particular for South African schools, where the emphasis has mainly been on rote-; or “parrot fashion” learning.

#### **1.1.5 A deliberate focus on creative problem solving**

Creative problem solving is widely applicable both within and outside of school and is therefore very important for learners.

#### **1.1.6 A description of lessons taught**

During the previous study (Hermanson, 1998) only Unit 1 was taught. This unit is called:

- **Unit 1: Meet your mind**

This unit explicitly teaches the four thinking dispositions. (For more detail refer to Hermanson, 1998).

The following units were taught during the present study:

- **Unit 2: Stand back and think**

This unit is concerned with fostering and promoting metacognition. There are two key concepts that help to do this: One concept is “Stand back and think”. This encourages learners to stand back and look at their thinking, before during and after a situation or event. The other image is “Be your own thinking coach”. At the same time learners’ awareness of the four thinking dispositions are maintained.

- **Unit 3: The understanding circle**

The “understanding circle” is a concept that is used in this unit to further promote learning with understanding. The “understanding circle” is a simple diagram of a circle with five questions around it. The five questions are:

- What is it like? - Here description, classification and categorisation are highlighted.
- Can I picture it? - Here the focus is on making mental images.
- How do things work? How well do things work? - This focuses on understanding the concept or topic.
- What are the causes and consequences? - Here the focus is on reasoning.
- What is uncertain about it? - Here the focus is on argument. Learners learn how to explore a topic or concept so that they can understand it better. The focus is again kept on the four dispositions in this unit. (Cilliers et al., 1994: 262)

- **Unit 4: Creative thinking**

There was not enough time to complete this unit.

(For a detailed list of all the lessons taught see Appendix 1.)

### **1.1.7 Teaching methodology utilised**

The developers of the programme looked at new developments in teaching methodologies. They looked in particular at Asher’s Total Physical Response, Krashen and Terrell’s Natural Approach, Gattegno’s Silent Way, Curran’s Community Language Learning and Lozanov’s Suggestopedia (Cilliers et al., 1994: 263).



The approach which they eventually adopted can be described as eclectic, with emphasis on suggestopedic methods and the utilisation of De Bono's CoRT tools.

The approach to the programme is therefore characterised by the the following three principles, as outlined by Cilliers et al. (1994: 264- 265):

- The situation in the classroom should be free from anxiety and fear and should be characterised by joy. The atmosphere should be relaxed and learning should be enjoyed.
- The involvement of the whole brain in the learning and teaching situation is essential because then learning is optimised.
- There should be an inter- relationship amongst all the role- players and aspects of the learning and teaching situation. This refers to the suggestive link which should exist between the various role- players in the learning situation.

The lessons usually start with a relaxation activity, so that learners start the lessons with a positive frame of mind, and include music, songs and story telling. The last activity in the lesson is usually a visualisation, where the learner has the opportunity to become quiet and reflective. Visual stimuli are also regarded as important, so posters are also used in the lessons to reinforce certain concepts. Extensive use is also made of co- operative learning strategies in group work, and many of the activities revolve around working with a partner and in a group.

### **1.1.8 Teaching and learning material**

The **Keys to Thinking Programme** consists of a teacher's guide and a learner's handbook. The teacher's guide provides detailed notes and directions.

## **2. RESEARCH OBJECTIVE AND AIMS**

The research objective and aims as stated in Chapter one (pp. 7- 8), are as follows:

The objective of this study is to evaluate the **Keys to Thinking Programme** as a follow-up study.

The aim is to determine the effectiveness of the programme in enabling the learners to become better thinkers and learners, by establishing if:

- they enjoyed the programme
- transfer took place
- learners were more aware of their own thinking
- learners were able to apply the four thinking dispositions and therefore became better thinkers.

## **3. RESEARCH METHOD**

### **3.1 Validation of qualitative and descriptive method utilised**

Whilst Hermanson's study was quantitative in nature, this study is qualitative and descriptive in nature. Although both research methods are acceptable for scientific research ( Allen, 1991;Yin, 1993; Scott, 1996; Jackson, 1995,



Silverman, 2000), for this particular study, the researcher preferred to work qualitatively because the nature of this research is descriptive, and has to do with processes, interactions, words and relationships rather than numbers. This reality is better served by a qualitative research design (Allen, 1991: 177-180; Flick, 1998: 4- 7; Hitchcock and Hughes, 1995: 25- 27; Jackson, 1995: 17; Morgan, 1998: 11- 13)

The following six assumptions which underlie qualitative research also seem more relevant in the light of the objective of the study (Merriam, in Cresswell, 1994: 145):

- Qualitative researchers are concerned primarily with **process** rather than outcomes or products.
- Qualitative researchers are interested in **meaning** – how people make sense of their lives, experiences, and their structures of the world.
- The qualitative researcher is the **primary instrument** for data collection and analysis. Data are mediated through this human instrument, rather than through inventories, questionnaires or machines.
- Qualitative research involves **fieldwork**. The researcher physically goes to people, a setting, site or institution to observe or record behaviour in its natural setting.
- Qualitative research is **descriptive** in that the researcher is interested in process, meaning, and understanding gained through words or pictures.
- The process of qualitative research is **inductive** in that the researcher builds abstractions, concepts, hypotheses, and theories from details.

### **3.2 The role of the researcher**

An important part of any qualitative study is that the researcher gives an assessment of his/her background knowledge, experiences and defines his/her role in the research (McIntyre, 1999: 176; Cresswell, 1994:147; Ely, Vinz, Downing, and Anzul, 1998:32). This will therefore be briefly stated below:

The researcher, as stated earlier in the introduction, has been a teacher for eighteen years. She developed an interest in cognitive education as a result of courses done while completing course work in both the Bachelor of Education and the Masters in Education degrees at the University of Stellenbosch.

The researcher was actively involved in teaching the thinking skills programme. This means that the researcher had the role of participant observer, and this is defined as “.... A special type of observation where the researcher is not merely observing but is actively involved in the process that is being observed and evaluated.” (Jackson, 1995: 128)

### **3.3 Sampling**

#### **3.3.1 Sampling method**

The sample used is purposive and convenient (Black, 1995: 49- 50). The previous study by Hermanson (1998) was conducted at a primary school with



Grade seven learners. As stated previously the programme was not completed and the learners subsequently moved to Grade eight at the high school. To ensure the continuity of the study, it was decided to continue the study with those learners who had been part of the original study.

### **3.3.2 Survey population**

The survey population are Grade 8 learners at a high school in Stellenbosch. There are both girls and boys in the group. Gender was not taken into account. The ages ranged from 13 to 18 years. The 30 learners were part of the original study of Hermanson.

### **3.4 Data collection**

Permission was obtained from the Western Cape Education Department and the school to conduct the research. The condition on which access to the school was granted, was that it not be identified in the study.

The lessons were taught twice a week by the researcher assisted by a teacher from the school. Originally the plan had been to train teachers at the school, but because of time constraints on the part of teachers this was abandoned. The lessons were taught to all the Grade 8 learners at the school. This took place over a period of eight months.

The following methods were used to collect data:

#### **3.4.1 Questionnaire**

As a research instrument, questionnaires are usually associated with quantitative research designs (Scott, 1996: 61), but according to Bless and Higson-Smith (1996: 122), it depends on the type of questions asked.

For instance, open-ended questions in a questionnaire would therefore be suitable for qualitative research designs.

Because of this reality, open-ended questions were therefore used in this research design. (See Appendix 2)

The purpose of the questionnaire was to ascertain how the learners felt about the programme as a whole and to establish if there had been transfer of the thinking skills acquired in the lessons to other subjects and life situations.

The first two questions deal with the principle that a learning/teaching situation should be characterised by joy and absence of fear and anxiety, which was an underlying aspect of the programme. (Cilliers et al., 1994: 264)

The questions follow directly:

**1. What did you enjoy about the lessons?**

**2. What did you not enjoy about the lessons?**

(See research objective and aims on p. 7, number 1)



The next three questions deal with learning, understanding and transfer of skills:

- 3. What did you learn in the thinking skills lessons?**
- 4. How can you use what you have learnt in the thinking skills programme in your other subjects at school?**
- 5. How can you use what you have learnt in the thinking skills programme at home and in other situations?**

(See research objective and aims on pp. 7- 8, numbers 2, 3, and 4)

Learners were free to answer the questionnaires in any of the official languages. This was because the learners were Xhosa-speaking and as English was their second language, this would give them an opportunity to answer in Xhosa if they wished to do so. (This was recommended by Hermanson, 1998: 42).

30 questionnaires were handed to the teacher who assisted with the programme, and she arranged for their completion. All of the questionnaires were handed back to the researcher in December 1998. With regard to the language issue, four of the learners answered in Xhosa and the rest in English. The questionnaires were completed at the end of the programme.

### **3.4.2 SPONTANEOUS SKETCH**

The spontaneous sketch is an instrument where the respondents are asked to write a few lines in response to a question or specific topic (Van Camp, 1996: 23). The reason for choosing this method, was because it gave the

researcher an opportunity to establish if the learners had really grasped the concepts that were taught. In this study the learners were asked to do two spontaneous sketches (see Appendix 3). The first, at the end of Unit 2, where they are asked to write ten lines describing an instance they were able to stand back during and after thinking. The purpose of this was to ascertain whether they were able to use the concept, “Stand back before, during and after thinking” – thus establishing if they were more aware about their thinking, that is, to see if they were capable of metacognition. (See research objective and aims pp. 7- 8, numbers 3 and 4.)

The second sketch is after Unit 3 where they were asked to write ten lines or more describing how they used the understanding circle to learn about and to understand something. The purpose of this was to establish if they were able to transfer (see research objective and aims , p. 7, number 2) the concept of the understanding circle to their school subjects and other aspects of life and, importantly, if they were able to “understand” and not just give back what they had heard or read.

Learners were free to use whatever language they were comfortable with.

The spontaneous sketches were completed in the class and learners were given about thirty minutes to complete it. The first spontaneous sketch was completed in August 1998, and the second in November 1998.



### **3.4.3 Observational notes**

Observations are an important method in qualitative research (Hedrick, Bickman, Rog, 1993: 83; Cresswell, 1994: 149).

For this reason, detailed notes were taken during and after each lesson. Some lessons were video-taped and observations made from watching it.

### **3.4.4 Focus group interviews**

Focus group interviews were conducted to further triangulate the research. Focus group interviews are defined by Beck, Trombetta and Share in Vaughn, 1996: 4) "... as an informal discussion among selected individuals about specific topics relevant to the situation at hand," whilst Morgan, says that "focus groups are fundamentally a way of listening to people and learning from them" (1998: 9).

The interviews were conducted with the learners in the class and fifteen of them were randomly selected to be part of the interviews.

The interviews were conducted with the learners and were video-taped. The interviews were conducted at the end of the programme and the question that was asked was:

**What did you learn from the Keys to Thinking Programme?**

The purpose of this question was to cross-check the findings of the

questionnaire and the spontaneous sketches (see research objective and aims, pp. 7- 8, numbers 1- 4).

### **3.4.5 Peer validation**

The researcher was assisted by a teacher from the school in teaching the lessons. This was very important with regard to the language situation, as lessons were conducted in English and the learners were Xhosa- speaking. After the lessons informal discussions about the lessons were conducted with the teacher, which were noted.

This served as a peer validation which can be defined as "... fellow teachers listening to each other attentively, considering the evidence and assessing if movement has or has not taken place in a given situation" (McNiff, 1995: 136).

## **4. VALIDITY AND RELIABILITY**

Validity has to do with the extent to which the material collected by the researcher presents a true picture of what is being claimed is being described (Hitchcock and Hughes, 1995: 105).

Hammersley defines reliability as follows: "Reliability refers to the degree of consistency with which instances are assigned to the same category by different observers or by the same observer on different occasions" (Silverman, 2000: 175). In other words, can the research be repeated using the same method by someone else and obtain the same results?



The following methods were employed to ensure validity and reliability of the study:

#### **4.1 Triangulation**

To ensure validity and reliability the researcher used the concept of triangulation. Triangulation is defined as using different methods of data collection to ensure validity and reliability (Anderson, 1994: 175; Cresswell, 1994: 158; Flick, 1998: 229; Graue and Walsh, 1997: 102; Hitchcock and Hughes, 1995: 180; Silverman, 2000: 177).

Triangulation makes it possible for researchers to be more confident of their results. In this study the researcher therefore makes use of different methods of data-collection.

#### **4.2 Chain of evidence**

To further ensure validity and reliability it was important to establish a chain of evidence. The principle is to maintain the data collected in such a way that it will be possible for an external observer to follow the study from the initial research questions to the conclusions (Yin, 1993: 96). Graue and Walsh (1997: 131) agree with this, but refer to a data record. The data that was collected is available for any external examination in this regard.

#### **4.3 Peer validation**

This has been discussed previously (p. 25). This method also served to ensure the validity and reliability of this study.

## 5. SUMMARY

In this chapter the **Keys to Thinking Programme** was briefly described with particular reference to the dispositional approach used in this programme and key concepts of the programme. These key concepts are: transfer, metacognition, understanding and creative problem solving. The lessons that were taught and the teaching methodology were also described.

Furthermore, the research design was presented, with special reference to the research objective and aims. The research method and the data collection procedures employed in this study: questionnaire, spontaneous sketch, observation, focus group interviews and peer validation, were described and validated.

Finally, the methods utilised to ensure the validity and reliability of this study: triangulation, peer validation and chain of evidence were discussed.

In the following chapter (Chapter three) the research findings will be presented, analysed and discussed.

## CHAPTER THREE: RESEARCH FINDINGS AND ANALYSES

### 1. INTRODUCTION

In the previous chapter the research design was described and validated. In this chapter the findings of the research will be analysed and interpreted, with particular focus on whether the research objective has been achieved. The research objective, as stated (Chapter one, pp. 7- 8), is to evaluate the **Keys to Thinking Programme** as a follow-up study and to do this by determining if the thinking skills programme enabled learners to become better thinkers and learners. This will be done by focusing on the following questions:

- Did the learners enjoy the programme?
- Did transfer take place?
- Were learners more aware of their own thinking?
- Were learners aware of and were they able to apply the four thinking dispositions?

### 2. DATA ANALYSES

The data was analysed by categorising the responses, according to common themes and patterns.

#### 2.1 Questionnaire

A total of 30 open- ended questionnaires were completed by learners and returned to the researcher. The procedure and the rationale for choosing the



questionnaire and the particular questions were dealt with in Chapter two.  
(See pp. 20- 22.)

### 2.1.1 Categorisation and discussion of questionnaire findings

The responses to the questions were categorised according to the procedure stated above, and all are presented verbatim below. (The findings will be discussed after the responses for each question have been presented):

#### QUESTION 1: What did you enjoy about the lessons?

- The learners enjoyed the fact that they were able to learn about thinking:

*"I enjoy about lesson because if I have a problem I think clear and careful because if I have a problem thinking skills help me."*

*"In this lesson I enjoy it because it change me life before you do something you must think and you must stand back and think."*

*"I enjoy it very well, because it teach me that I must think before doing the thing."*

*"It taught me how to think and how to describe things how also they work and how well does it work."*

*"I learned that I have to think before doing something."*

*"I enjoy it very well because there was nothing I can understand, but now I understand everything because of it."*

*"In the lesson I enjoy that I must learn but now I know that there are four things I must take time to think, carefully, broadly, organised."*

*"About the lessons I enjoy many things like when I want to do things I must take time to think before I do it."*

*"The lessons was good, and I enjoy very much because in the period after lunch is nothing now we do, so the thinking skills is good for us."*

*"I enjoy very well because you must use your brains and think before you do something."*

*"What I enjoy about this lessons is that we were doing some activities about thinking skills."*

*"What I enjoy is that I learn many things in the lessons and I learn how to think broad."*

*"I enjoy that when I write a test I must think before I write."*

*"I enjoy that I learn many things in the lessons and think careful."*

*"I liked the lessons because it has broadened my thinking. It learnt me to think even before I can do something."*

*"It helped me to think broadly."*

*"It helped me to think broadly because before I was unable to do so."*

- The learners enjoyed the lessons:

*"I enjoyed it because it was fun and exciting, it helped me to do things that are good and it make things easy for me."*

*"I enjoy everything that I have learn in thinking skills every Tuesday after lunch."*

*"I enjoyed lots of things in the thinking skills. It is wonderful you'll feel lots of excitement at each and every lesson."*

*"In this lessons I enjoy it and it was fun. To me it was good and so nice."*



- They enjoyed reading and listening to stories:

*"I enjoy the lesson because it is talking about things which were happening example a man was going to look job." (refers to a story in the programme)*

*"I enjoy this lesson because I know what I must do before I do things I must think first and to listen stories."*

*"I enjoyed listening to the stories which our teacher told us during the lesson."*

*"I enjoy reading stories in the book. I like these stories because some of them you can learn something from them. I enjoy reading."*

It is clear from the findings of question 1 that the learners enjoyed learning thinking skills and enjoyed the lessons. Some learners also specifically mentioned that they liked the stories that were part of the lessons.

The findings of question 1 illustrate one of the basic premises on which the **Keys to Thinking Programme** is founded: "... that if learners enjoy the lessons and are in a relaxed frame of mind, and are able to overcome barriers of anxiety and fear, the situation becomes more conducive for learning to take place" (Cilliers et al., 1994: 264).

#### **QUESTION 2: What did you not enjoy about the lessons?**

- Most of the learners stated that there was nothing that they did not enjoy and that they would have liked the lessons to continue:

*"Nothing and would like to continue the lessons."*

*"There's nothing I didn't enjoy. I enjoy every moment of it."*

*"There was not enough time to learn more."*



*"Nothing."*

*"Nothing, because all things we do in the thinking skills was very nice to me."*

*"There is nothing. I'm not enjoyed about the lessons because there were lessons that I want to learn."*

*"There is nothing that I don't enjoy all the lessons."*

*"I enjoy all the lessons."*

*"Now I enjoy everything in the lessons so I wish the people must come back for us to teach us because is very enjoyable this lessons."*

*"About the lessons, I enjoy good lessons like it help me in many things and it shows me the right things."*

*"Nothing because everything was good to me. The teacher, everything was good."*

*"Nothing."*

*"Nothing I enjoy everything."*

*"I enjoy everything about this lessons."*

*"I don't have a thing that I didn't enjoy in thinking skills, I enjoy everything."*

*"I liked the lessons because it educates."*

- Some of learners mentioned that they did not enjoy the relaxation exercises, because they had to close their eyes

*"that we must close our eyes and I don't like that thing."*

*"I did not enjoy it when they told us to close our eyes. I don't like closing my eyes in daylight."*

*I did not enjoy that we must close our eyes because I don't know the reason for that."*

- The following were responses which were not categorised:

*"I did not enjoy the lesson when the man walked and walked and saw himself in front of his house."*

*"The only thing that I'm enjoyed that we not finished that book and someday you not coming here in school so I don't like that."*

*"I didn't enjoy it because sometimes we were doing and the same thing so I didn't like that."*

*"There were people that were making a noise and I could not hear all things I wanted to know. However, I liked this education. Thank you."*

With regard to the findings of question 2, it is obvious that there was very little that the learners did not enjoy. This again links to the "joy principle" (p. 7).

The issue of the relaxation exercises was raised by some of the learners. They mentioned that they did not like closing their eyes during the exercises. It is, however, not necessary to close your eyes when you are doing the relaxation exercises and it is important to bear this in mind for future reference.

### **QUESTION 3: What did you learn in the thinking skills lessons?**

- Many learners wrote that they learnt that they must stand back and think before they do something :

*"I learn to think good and take time. It is fun to me and the thinking skills."*

*"I learn the lesson once bitten, twice shy in thinking skills, no violence. If I write history, before I write history I think about thinking skills."*



*"I learned that I must not just do something. I have to think first and then stand back before I do something."*

*"I've learnt that its good to stand back and remember my thinking coach before I do or say something."*

*"I learn that if you want to do something you must do it yourself –you must be a coach. You must take time think when you do."*

*"I learn how to take time to think."*

*"I learnt that you must think before you do something like if you wanted to work, you must take time to think what you must do and about your problems."*

*"I learn I must think first before I do something maybe I will get into trouble."*

*"I learn to think careful and when I want to know something that I didn't know I must think careful first."*

*"I learn you must think before you do something."*

*"I learned how to be my own thinking coach and I have to stand back and think before I do something."*

*"that to stand back and think about thinking."*

*"I've learnt that I must think before during and after I do anything. It is good to think."*

*"I learnt many things in this thinking skills. When I close my eyes I am able to see what I am thinking."*

*"It learnt me to be able to take time before I make a decision."*

*"It helped me to concentrate when I am thinking and not to have a divided attention."*

*"It helped me to take time to think, that help a lot."*



- Learners noted that one must think broadly, adventurously and organised:

*"It helps me to think better and broadly and I can even solve difficult problems by myself without someone else's help."*

*"I learn that before you do anything you must think broad and adventurous and I learn that even in your school work."*

*"I learn that when I want to do something I must think broad and adventurous."*

*"In thinking skills I learnt that must think broadly, organised and adventurously, when you are going to write a test or when you are going to do a thing."*

*"Think organise and adventurous, think carefully and broad."*

*"I learn to think broad and organised and I think before I do something and I will do it wrong if I don't think."*

*"I learn that it is good to stand back because if you don't stand back and think you will be get into big trouble."*

- The following responses were not categorised:

*"You must use the understanding circle so that you can use it to understand all the questions that are there."*

*"In the thinking skills I saw many things that I can do when I grow up and it can help me."*

*"...before I write History, think about thinking skills."*

With regard to question 3 it is clear that the learners do have an understanding of the key concepts that were taught in the **Keys to Thinking Programme**: "stand back before, during and after thinking", the "thinking coach" and the "understanding circle". This illustrates two of the objectives of

this study, namely to establish if transfer of the skills and concepts took place and to establish if learners were more aware their own thinking (see p. 7).

The learners were also able to use the four dispositions to improve their thinking: "Give thinking time!"; "Make thinking broad and adventurous!", "Make thinking organised!" and "Make thinking clear and careful!" In this regard, it is important to bear in mind that English is their second language, yet they were able to use the concepts and phrases with understanding. This links with the objective about whether the learners were able to apply the four dispositions (see p. 8).

**QUESTION 4: How can you use what you have learnt in the thinking skills programme in your other subjects at school?**

- Learners found the understanding circle useful when trying to understand the various subjects:

*"I can use the understanding circle when I want to understand one of my subjects."*

*"You must use the understanding circle. After that I must think broadly, but now I am thoughtful, no matter what you want to do the understanding circle will help you."*

*"You must use the understanding circle in your school work even outside the school. You must take time to think. In the beginning I was thinking the lessons is a joke."*



- Learners used the relaxation techniques before they wrote a test:

*"Before I write a test I relax and stand back and think, if I do that every time I am going to pass all my tests."*

*"I must relax and start to think what I am going to do and during what I am going to do after. I must check all my mistakes."*

*"It's easy as ABC. I must relax and stand back to think what I'm doing and after all I must check my mistakes."*

- Learners found it useful to stand back and think before writing a test, or doing their school work:

*"Before write a test let's say I'm going to write a test, I must relax and stand back and think. If I do that every time when I am going to write test I'm going to pass all my tests."*

*"I'm going to be my thinking coach before I must study the book, during I will organise all my tools after I will look at my mistakes."*

*"I can use this thinking skills when am writing test."*

*"I must think clear and careful if I want to pass a test and I must think organised and careful when I am writing exams."*

*"When I am going to write a test I think broad and careful."*

*"Can use take time before you do and think well and you must move back."*

*"I can use it when I am writing a test – take time to think, think broadly and adventurous, think organised and careful."*

*"In the thinking skills programme I can use it in other subjects at school like when I write test. I learn this – I must take time to think and think broadly."*



*"Before I answer a question from my teacher and before I write a test and if some pupils have done the wrong thing to me – so I have to think before I punish them."*

*"I can use the Keys to Thinking when I am writing a test."*

*"If you study for the test you must stand back and read your books and sit back and think and watch it and describe it and then you understand it."*

*"I will think before I am going to do first and after that I must write it."*

*"If I am writing a test I will use all my thinking, for example AGO."*

*"If I write a test I think clear because if thinking skills not come at my school – I'm not think better. I enjoy thinking skills."*

*"I can use it on my test and class work or on my project or to understand something that I don't know. It is to call on the thinking skills programme."*

*"It can help me a lot in preparing for the December examinations."*

In responding to question 4, learners demonstrated that they could use the understanding circle and the relaxation techniques in the school context – in particular with regard to writing tests or examinations. Together with these aspects of the programme, learners also stated how they could use the following thinking dispositions in their class work and whilst preparing for and writing tests and examinations: "Give thinking time!", "Make thinking broad and adventurous!", "Make thinking clear and careful!" and "Make thinking organised!". Learners also referred to having to "stand back and think" before writing a test and being their own "thinking coach". This reflects a metacognitive disposition.

They were therefore able to transfer these concepts from the thinking skills

programme to their school work. This links with the objective about whether the learners were able to transfer what they learnt in the lessons to other contexts (see p. 7), and also to the objective with regard to the thinking dispositions and metacognition (see pp. 7- 8).

**QUESTION 5: How can you use what you have learnt in the thinking skills programme at home and in other situations?**

- Learners were able to use what they had learnt to solve problems and deal with situations at home:

*"If I have a problem at home it will help me, actually the skills that I learnt will help me and in other situations too. Now I can even stand back and think."*

*"If my friend tells me anything I think better than at first."*

*"Understanding may help you at home or a other situations. One day me friend was going to run away from home. I told her that my friend you must stand back and think before you do anything and in the morning she comes to and said I won't go anymore."*

*"You can use it when there is a problem at home or anything that your parent don't understand you can help them to understand it because you learnt it at school and they can be proud of you about you if you do that."*

*"In the thinking skills programme at home and in other situations I can use it to have respect for my parents. I can use it to be careful in many things that it is going to be dangerous to my future."*

*"When I want to help my friends."*

*"I can use it at home when I have problems and if my mother says I can go to town for her to buy something needed at home. I must think before I take the things."*

*"At home I think broadly and organised so that everything will be easier for me to do."*

*"It help me in family matters in thinking broadly. Education is very important."*



- Learners were able to use the thinking skills to make decisions about important issues:

*"When I do something which is wrong, I can stand back on my thinking and analyse thinking."*

*"I will just think this thing I'm going to do – is it right or is it wrong, when it is wrong I'm not going to do it."*

- Learners were able to use the thinking skills, but in particular learners said that the understanding circle was a useful tool to find out about something they did not know:

*"At home I can use my thinking skills on other stuff that I don't know. At home I can use the understanding circle maybe on a thing that I don't know and it is the first time that I see it."*

*"I can use the Keys to Thinking when I am doing something at home like when I see something new that I don't know, I will use the understanding circle."*

*"If my mother sent me something and I don't know what it is I can just remember my understanding circle and I can ask my mother the questions from the understanding circle. So I can understand what it look like."*

*"Understanding circle is the way you can solve your problem. In understanding circle there are questions you must ask yourself. 1. How does it look? 2. How does it work? 3. What is the consequences? I like thinking skills because I want to be thoughtful."*

*"When I am at home and I want to think of something I must just remember what the teacher said to me, the understanding circle."*

With regard to question 5, the learners cited numerous examples where they were able to use that they learnt at home and with their friends. In particular they said how they were able to use the thinking skills to make important



decisions about moral and life issues. In some instances they were also able to explain why they had acted in a specific way - reflecting a metacognitive disposition. Learners specifically referred to the understanding circle as a means of understanding something and solving a problem.

The findings of question 5 link to the objectives about transfer (see p. 7) and metacognition (see p. 7).

### **2.1.2 Discussion of main questionnaire findings**

Whilst the findings and the responses to the various questions were discussed as they were presented it is also necessary to discuss the questionnaire findings as a whole in particular with regard to the questions posed on page 28.

The first question is: Did the learners enjoy the programme? The responses to questions 1 and 2 affirmed that the learners had indeed enjoyed the programme and its different elements. This concurs with the finding of Hermanson: "The learners enjoyed the lessons, especially the story aspect of the lessons" (1998: 23)

With regard to the second question: Did transfer take place? Transfer definitely took place and this was illustrated in responses across the spectrum from question 1 to question 5 – where learners gave various examples of how they had used or could use what they had learnt in the thinking skills lessons. This confirms the finding of Hermanson: "On the

whole the learners applied many of the newly acquired skills in school work and general life” (1998: 41).

The third question is: Were learners more aware of their own thinking? Learners gave numerous examples of being aware of their thinking – being their own “thinking coach” and “standing back before, during and after thinking”.

The fourth question is: Were learners aware of and able to apply the four thinking dispositions? With regard to this question there is ample evidence from the responses, that learners were indeed aware of and able to apply the four thinking dispositions. This confirms the finding of Hermanson: “Transfer of the dispositions did take place, as observed by the learners’ teachers” (1998: 39).

The overall finding of the questionnaire is therefore that the learners had become more aware of their thinking and were able apply what they learnt in their school work and other more general applications.

## **2.2 Spontaneous sketch**

The procedure followed to complete the spontaneous sketches was described in Chapter two (pp.22- 23). Fifteen learners were randomly selected to complete a spontaneous sketch on each of the following topics:

**Spontaneous Sketch 1: Stand back and think about thinking**

**Spontaneous Sketch 2: Using the Understanding circle**

### 2.2.1 Categorisation of spontaneous sketch findings

In this section the spontaneous sketch findings are presented, followed by a summary of these responses and a discussion thereof.

#### Spontaneous sketch 1:

- The learners were able to “stand back and think” in various situations (at home, at school, playing sport and being with friends.)

**TABLE 1: Summary of Learners’ Responses to Spontaneous Sketch 1**

<b>At school:</b>	They stood back and thought, before, during and after writing a test. Mathematics was frequently mentioned as well as doing their work in class.
<b>At home:</b>	They were able to stand back and think when they went to the shop and had to remember what to buy, and when they had to organise what to take with, where they were going, and how they were going.



<b>Playing Sport:</b>	<p>Learners stated that they were able to stand back and think, when they were on the sportsfield, playing soccer. They were able to think before the game to prepare their strategy, during the game to check if their plan was working, and after the game to reflect to see whether they had achieved what they had set out to do.</p>
<b>Being with Friends:</b>	<p>Learners wrote that they were able to stand back and think when they encountered difficult situations. Examples of these situations were friends telling them not to go to school, and friends wanting them to steal from a shop. They were able to stand back and think and make the right decision.</p>

## Spontaneous sketch 2:

The learners responded by writing that they were able to use the “Understanding circle” in the following instances:

**TABLE 2: Summary of Learners’ Responses to Spontaneous Sketch 2**

USING THE UNDERSTANDING CIRCLE	EXAMPLES
<b>To learn about something and to find out how it works and how well it works:</b>	Learners said that they could find out about a cell phone, a television set or a pen. They could find out how it works and how well it works.
<b>To find out about a subject/ topic:</b>	Learners stated that they could find out about HIV/AIDS.
<b>To identify an object:</b>	Learners said that if they came across an unidentified object, they would be able to find out about it, by using the understanding circle.

Three of the learners were not able to complete the spontaneous sketch as they were not clear about the concept of the “understanding circle”.

### 2.2.2 Discussion of the spontaneous sketch findings

With regard to spontaneous sketch 1, it is clear from the responses that the learners had grasped the concept of “standing back and thinking” and were

able to put this disposition into practice. This links to the objective about metacognition (see p. 7).

Furthermore, the “understanding circle” (spontaneous sketch 2) was understood by most of the learners, although some of the learners were not able to articulate a clear understanding of the concept. This could be attributed to various factors (such as not enough practice with the concept, so that transfer did not take place or that these learners needed more time to grasp the concept). This links to the objective about transfer (see p. 7).

### **2.3 Observational notes**

The following observations were noted from the lessons (including video tapes):

- Some learners had difficulty in settling down to the relaxation exercises. In later lessons, this became easier.
- Learners enjoyed the songs and the movement that were part of the lessons. They often asked to sing at the beginning and end of lessons.
- The stories appealed to the learners, especially if there was humour.
- Learners found it difficult to work in groups at first and it took time to organise them into groups. Later on it became easier.
- The classes that were taught were large (two grade 8 classes were combined) necessitating repetition of what had been said because not everyone had heard it the first time.
- The learners enjoyed the various activities and were very keen to present their work to the larger group.



- Time was often a problem, because learners took a long time to come to class and then it was often necessary to shorten the lessons and continue with that lesson in the following lesson.

### **2.3.1 Discussion of observational note findings**

From the findings it is clear that the learners enjoyed being actively involved in the programme – through songs, movement and various activities. This confirms the findings of the questionnaire (question 1) and serves to illustrate the objective of the study with regard to the “joy” principle (p. 7) and confirms the finding of Hermanson (1998: 23).

The issue of the relaxation exercises was raised before in the responses of learners to the questionnaire.

### **2.4 Focus group interviews**

The procedure and rationale of the focus group interviews were described in Chapter two (pp. 24- 25). The interviews were videotaped and transcribed. The question that was discussed with them was:

**What did you learn from the Keys to Thinking Programme?**

The responses were categorised and the following findings can be concluded from them:

- Learners learnt that it was important to take time to think.

- They learnt that they could use the understanding circle if they did not understand something.
- Learners learnt that they must stand back and think before they write a test or they would make mistakes.
- They learnt the importance of thinking broadly, carefully and in an organised way.
- Learners learnt that they could use the skills that they had learnt to make important decisions about life, like saying 'no' to smoking dagga and using alcohol.

#### **2.4.1 Discussion of focus group interview responses**

The learners were able to apply what they had learnt in the lessons to their school work and other situations. They were also able to apply the four thinking dispositions. They also demonstrated an awareness of being able to think about their thinking – this implies that they were able to use metacognition.

These findings illustrate the objectives of this study with regard to: transfer, the thinking dispositions and metacognition (see pp. 7- 8). This also confirms the findings of the questionnaire and the spontaneous sketches and concurs with the findings of Hermanson with regard to transfer and the awareness and application of the four thinking dispositions (1998: 39).

#### **2.5 Peer validation**

As noted in Chapter two (see p. 25), regular discussions were held between the researcher and the teacher from the school, who co- taught some of the



lessons and translated these from English to Xhosa. The role played by that teacher was vital, because during our discussions we realised that it would be important to explain the key concepts in the learners' mother tongue.

Strategies for lessons were discussed, particularly about the management of the large class. One strategy which was implemented was that one teacher would move around to the back of the class to ensure that learners were on task and understood what was happening in the lesson.

The teacher, who assisted the researcher, was also the English teacher at the school and she found that the ability of the learners to speak and read English had improved significantly since their participation in the **Keys to Thinking Programme**. This finding confirms the observation of Hermanson (1998: 23): "After one unit was taught, the learners were more confident in speaking English." This teacher also reported that the other subject teachers of the learners had noticed an improvement in the way learners approached their work.

### **2.5.1 Discussion of peer validation findings**

It is clear from the findings that the teacher of the school played an important role with regard to the language question, but also served as a link to the rest of the school. These aspects were also important for the research process because it ensured that there was constant checking and reflection on the process.



### 3. SUMMATIVE RESEARCH FINDINGS

The following is a tabulation of the main research findings and how each one is supported by the specific method of research. (It also includes a column to indicate if the particular finding concurs with Hermanson's research findings:

**TABLE 4: Summative Research Findings**

FINDING	HERMANSON'S RESEARCH FINDINGS	QUESTIONNAIRE	SPONTANEOUS SKETCH	OBSERVATION	FOCUS GROUPS	PEER VALIDATION
The learners enjoyed the lessons.	*	*		*		
Learners were able to transfer skills and concepts to subjects and tests at school and situations outside of school.	*	*	*		*	*
Learners were able to "stand back and think about their thinking" and use the "thinking coach".		*	*		*	
Learners were able to use the thinking skills which they had acquired to make Important decisions about moral and life issues.	*	*	*		*	

FINDING	HERMANON'S RESEARCH FINDINGS	QUESTIONNAIRE	SPONTANEOUS SKETCH	OBSERVATION	FOCUS GROUPS	PEER VALIDATION
Learners were able to use the "understanding circle" and therefore would be able to better their understanding of concepts and topics.		*	*		*	
Learners were able to apply the thinking disposition: "Give thinking time!"		*	*		*	
Learners were able to apply the thinking disposition: "Make thinking broad and adventurous!"	*	*			*	
Learners were able to apply the thinking disposition: "Make thinking clear and careful!"	*	*			*	
Learners were able to apply the thinking disposition: "Make thinking organised!"		*			*	
Some learners did not understand the purpose of closing their eyes during the relaxation exercises.		*		*		

The following findings concur with Hermanson's findings. (It is important to bear in mind that Hermanson's study only covered one unit of the programme):



- The learners enjoyed the lessons (Hermanson, 1998: 23, 41).
- Learners were able to transfer skills and concepts to subjects and tests at school and situations outside school (Hermanson, 1998: 39, 41).
- Learners were able to use the thinking skills which they had acquired to make important decisions about moral and life issues (Hermanson, 1998: 22, 23).

With regard to the four thinking dispositions, the findings show that the learners were able to apply all of them. Hermanson's findings showed that there had only been an improvement in the application of two of the dispositions: "to think broadly and adventurously" and "to think clearly and precisely" (Hermanson: 1998: iii). The findings of the current study could be attributed to the fact that learners had been exposed to the programme and the four dispositions for a longer period of time and were more familiar with them.

The findings, furthermore, clearly show that the learners related to the programme very well and because they enjoyed it, they were more receptive to learning new concepts and ideas. They were also able to transfer what they had learnt, and the learners were more aware of their thinking and of being thoughtful.

With regard to the four questions posed on page 28, it is clear that the learners were able to meet those criteria.



From the above findings it is therefore possible to conclude that on the whole the **Keys to Thinking Programme** was effective and achieved what it had set out to do, and that the learners were more effective thinkers at the end of the programme.

#### 4. SUMMARY

In this chapter the data was collected through various methods: questionnaire, spontaneous sketches, observational field notes, focus group interviews and peer validation were presented, analysed and discussed.

The findings were discussed in the light of the research objectives and aims, which were to evaluate **the Keys to Thinking Programme** as a follow- up study and to determine its effectiveness by determining if it enabled learners to be more effective thinkers, by establishing if they had enjoyed the programme, were able to transfer what they had learnt to other contexts, were more aware of their own thinking and of the four thinking dispositions and were able to apply them.

It was found that learners on the whole had enjoyed the programme, had become more thoughtful, were able to transfer what they had learnt and were more aware of their thinking. They were also able to apply the four thinking dispositions.

As this is a follow- up study it was also important to look at how the findings of this study corresponded to that of Hermanson (1998) and it was found that the

findings concurred on three main aspects: transfer, enjoyment of the programme and the four thinking dispositions.

Chapter four will deal with the conclusions, limitations and recommendations of this study.

## CHAPTER FOUR: CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

### 1. INTRODUCTION

The objectives and aims of this study were to evaluate **the Keys to Thinking Programme** as a follow-up study and to determine its effectiveness in enabling learners to be better thinkers and learners by establishing if:

- The learners enjoyed the programme.
- Transfer took place.
- Learners were more aware of their own thinking.
- Learners were able to apply the four thinking dispositions.

(See Chapter one, pp. 7- 8.)

This chapter will draw the final conclusions of this study as well as presenting the limitations and recommendations of this research study.

### 2. CONCLUSIONS

The following conclusions are obvious:

- The learners enjoyed the programme and it is therefore possible to conclude that there were conditions conducive for effective learning to take place, and that learners were more open to learning new concepts and skills, and that transfer therefore, also took place.
- Learners were able to apply the skills and concepts to their school work and other situations.



- There is evidence that learners were becoming aware of their thinking and were therefore able to apply metacognition to their thinking.
- The learners were aware of the four thinking dispositions and could apply them to their thinking.
- The findings of this study concur with those of Hermanson (see Chapter 3, pp. 51- 52).

These conclusions verify the objective and aims of this study (Chapter one, pp. 7- 8), and it is possible to conclude that the **Keys to Thinking Programme** was effective in enabling learners to become more effective thinkers.

### 3. LIMITATIONS OF THIS STUDY

The following can be regarded as limitations to this study:

- **Language:**

The lessons were taught in English. The learners' first language is Xhosa and this presented some problems because they did not always understand something the first time and it was often necessary to repeat aspects of the lessons. This was partly overcome by having a teacher who was Xhosa-speaking to co- teach and translate. With regard to the questionnaire and the spontaneous sketch, learners were able to answer these in the language of their choice. This was an option which some of them exercised. The researcher was, however, not able to ask more probing, in-depth questions, whilst conducting the focus group interviews, because of the language limitations.

- **Time:**

Time was sometimes a problem, as it took a while to get all the Grade 8 learners together. This meant that it was not always possible to finish a lesson during the period and it had to be continued the next time. In the long term this impacted on the lesson schedule and the last unit, Unit 4, was not completed.

- **The subjectivity of the researcher:**

The researcher was not a teacher at the school and therefore not part of the school community. This can be regarded as a limitation because valuable insights could have been gained with regard to the impact of the thinking skills programme if the researcher was part of the school.

- **The scope of the research:**

This research study had a limited scope and because of this, the terms of reference have not fully been explored. Issues such as the language issue (the fact that Xhosa was their first language and the programme was taught in English) and the role of language in cognition need to be explored in much more depth. Another issue which needed to be addressed in more depth is the issue of metacognition and the question needs to be asked if it would be possible to measure the level of metacognition. A further implication of the limited scope of the research is, that in the data analysis, the coding categories were left broad to accommodate the full range of responses of the learners. This was



necessary because of the small sample group and the qualitative nature of the research.

#### 4. RECOMMENDATIONS:

The following are the main recommendations flowing from this study:

- The programme or at least the key concepts should be taught in the mother tongue of the learners.
- Some learners were not comfortable with closing their eyes during the relaxation exercises. It should be pointed out that they do not need to close their eyes to do the exercises effectively.
- Cognitive education should be part of teacher training, especially with regard to Curriculum 2005, enabling thinking skills to become part of the school curriculum, starting from pre- primary level.
- In- service training of teachers with regard to cognitive education should take place on a regular and continuous basis.
- The teaching of thinking skills must be regarded as long term intervention.
- The following issues need to further researched:
  - The role of language in cognition – Is it possible to think effectively in a second language? Which language should be used as the medium of instruction when teaching thinking?
  - Whether it is possible to measure the level of metacognition?

#### 5. SUMMARY

In this chapter the conclusions to the study were presented. The conclusions are that on the whole the **Keys to Thinking Programme** was effective in



enabling learners to think more effectively, that the findings of this study concurred with those of Hermanson (1998) and that the objective of the study had been reached.

The limitations of this study were language, time, the subjectivity of the researcher and the scope of the study.

The recommendations which were made relate both to the **Keys to Thinking Programme** and to the implementation of a thinking skills programme in general.

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## APPENDIX 1: LESSONS TAUGHT

### UNIT 2: STAND BACK AND THINK

1. Stand back and think about thinking
2. Stand back and notice thinking
3. Stand back and notice thinking (continued)
4. The thinking coach
5. Become your own thinking coach
6. Stand back and think before thinking
7. Stand back and set goals (AGO)
8. Stand back during thinking
9. Stand back after thinking
10. Standing back before and during thinking
11. Standing back after thinking

### UNIT 3: THE UNDERSTANDING CIRCLE

1. What is the understanding circle?
2. What is it like? Describe it (CAF)
3. What is it like? Compare it (Compare)
4. How does it work? (Analyse)
5. How does it work? (continued) (AGO)
6. How well does it work? (PMI)
7. How does recycling work?
8. How well does recycling work?
9. What are the causes?
10. What are the consequences? (C & S)
11. What is uncertain about it? (Evidence)
12. What is uncertain about it? (continued) (Evidence)
13. What else can we understand by using the understanding circle?
14. Understanding the process of making democratic decisions
15. Understanding the process of making democratic decisions (continued)



**APPENDIX 2: QUESTIONNAIRE**

**KEYS TO THINKING**

Dear Learner

We hope you have enjoyed the Keys to Thinking Programme this year and that you have found it useful. We would like you to answer the following questions so that you can tell us how you found the programme. You may answer in whichever language you feel comfortable.

Thank you and good luck for the future!

1. What did you enjoy about the lessons?

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2. What did you not enjoy about the lessons?

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3. What did you learn in the thinking skills lessons?

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4. How can you use what you have learnt in the thinking skills programmes in your other subject at home?

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5, How can you use what you have learnt in the thinking skills programme at home and in other situation?

.....

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## APPENDIX 3: SPONTANEOUS SKETCHES 1 AND 2

### SPONTANEOUS SKETCH 1:

#### KEYS TO THINKING

GIVE ONE EXAMPLE WHERE YOU WERE ABLE TO USE THE UNDERSTANDING CIRCLE TO LEARN ABOUT SOMETHING. IT CAN BE AT SCHOOL OR AT HOME.

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Write about 10 lines. You can write in any language!!!

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**SPONTANEOUS SKETCH 2**

**KEYS TO THINKING**

WRITE TEN LINES OR MORE DESCRIBING A SITUATION AT SCHOOL OR ELSEWHERE, WHERE YOU WERE ABLE TO STAND BACK BEFORE THINKING, STAND BACK DURING THINKING AND STAND BACK AFTER THINKING.

Write in whichever language you are comfortable with!!

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